

1 1. A method of inducing an immune response in a fish against one or more
2 pathogens which comprises:

3 transforming a bacterium with a eukaryotic expression vector comprising DNA of
4 interest encoding at least one protein antigen for each of the pathogens;

5 killing the bacterium;

6 immersing the fish in a solution comprised of the transformed killed bacterium to
7 effect the expression of the protein antigen by the fish.

1 2. The method according to claim 1 wherein the fish is selected from the group of
2 finfish.

1 3. The method according to claim 2 wherein the bacterium is selected from the
2 group consisting of *E. coli* and *V. anguillarum*.

1 4. The method according to claim 3 wherein the DNA of interest is selected from the
2 group consisting of *p57* gene from *Renibacterium salmoninarum*, the *empa* gene from
3 *Vibrio anguillarum*, the *aspa* gene from *Aeromonas salmonicida*, the *omp48* and *omp38*
4 genes from *Aeromonas veronii*, and the genes coding for the G proteins from the
5 Infectious Hematopoietic Necrosis Virus and the Viral Hemorrhagic Septicemia Virus.

1 5. The method according to claim 4 wherein the plasmid comprises a promoter of
2 fish origin, a polyadenylation signal of fish origin and a kanamycin resistance cassette

1 6. The method according to claim 1 wherein the bacterium comprises an avirulent
2 strain of *V.anguillarum*, the strain characterized in that it is incapable of expressing a
3 functional *mugA* protein.

1 7. A method of inducing an immune response in a fish against one or more
2 pathogens which comprises:

3 immersing the fish in a solution comprised of a live, attenuated strain of
4 *V.anguillarum*, the strain characterized in that it is incapable of expressing a functional
5 *mugA* protein, the strain having incorporated therein a plasmid comprising:

6 DNA of interest encoding at least one protein antigen for each of the pathogens,
7 the method characterized in that the protein antigen is produced by the fish.

1 8. The method according to claim 7 wherein the fish is selected from the group of
2 finfish.

1 9. A method of inducing an immune response in a fish against one or more
2 pathogens which comprises:

3 immersing the fish in a solution comprised of a dead, attenuated strain of *V.*
4 *anguillarum*, the strain characterized in that it is incapable of expressing a functional
5 *mugA* protein, the strain having incorporated therein a plasmid comprising:

6 DNA of interest encoding at least one protein antigen for each of the pathogens,
7 the method characterized in that the protein antigen is produced by the fish.

1 10. The method according to claim 9 wherein the fish is selected from the group of
2 finfish.

1 11. A method for the delivery of DNA in a fish which comprises:
2 transforming a bacterium with a plasmid comprising DNA of interest encoding at
3 least one protein; and
4 immersing the fish in a solution comprised of the dead, whole celled, bacterium to
5 effect the production of the protein by the fish.

1 12. The method according to claim 11 wherein the DNA of interest is selected from
2 the group consisting of of *p57* gene from *Renibacterium salmoninarum*, the *empa* gene
3 from *Vibrio anguillarum*, the *aspa* gene from *Aeromonas salmonicida*, the *omp48* and
4 *omp38* genes from *Aeromonas veronii*, and the genes coding for the G proteins from the
5 Infectious Hematopoietic Necrosis Virus and the Viral Hemorrhagic Septicemia Virus.

1 13. The method according to claim 12 wherein the fish is selected from the group
2 consisting of finfish.

1 14. The method according to claim 13 wherein the bacterium is selected from the
2 group consisting of *E. coli*, *Vibrio.anguillarum*, *Aeromonas salmonicida*, wild-type
3 *Vibrio* spp, *Yersinia ruckeri*, *Aeromonas veronii*, *Aeromonas hydrophila*, and
4 *Edwardsiella ictaluri*.

1 15. The method according to claim 14 wherein the plasmid comprises a fish
2 promoter, a polyadenylation signal of fish origin and a kanamycin resistance cassette.

1 16. The method according to claim 15 wherein the polyadenylation signal is wolfish
2 AFP poly A.

1 17. The method according to claim 11 wherein the bacterium comprises an avirulent
2 strain of *V. anguillarum*, the strain characterized in that it is incapable of expressing a
3 functional *mugA* protein.